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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,823	07/29/2003	Baoxin Li	7146.0163	8148

47915 7590 06/29/2005

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EXAMINER	
SEVER, ANDREW T	

ART UNIT	PAPER NUMBER
2851	

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/630,823	LI ET AL.	
	Examiner	Art Unit	
	Andrew T. Sever	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2004 and 11 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-65,67-72 and 78-85* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-65,67-72 and 78-85* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/16/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 8/16/2004 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

Japanese reference 3-120526 has no translation and not statement of relevancy and accordingly it was not considered. All other documents and patents were considered.

Drawings

2. The drawings were received on 4/11/2005. These drawings are acceptable.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85 are rejected under 35 U.S.C. 102(e) as being anticipated by Sukthankar et al. (US 6,753,907.)

Sukthankar teaches in figure 2

A method for adjusting keystoning in a projector, comprising:

(a) sensing using an imaging device at least two boundaries defining a projection screen (Sukthankar teaches that projection screens are typically a quadrilateral in column 2 lines 1-20 and teaches in column 4 lines 40-52 that when determining boundaries electronically of a quadrilateral the 4 corners are used *as is claimed in applicant's claims 2-5*);

(b) determining a transformation to adjust the keystoning of an image projected from said projector (32);

(c) modifying said image projected from said projector in accordance with said transformation (34);

(d) projecting said modified image from said projector, wherein said imaging device and said projector are maintained in a fixed relationship with respect to each other(with regards to projecting, although not explicitly stated in the flow chart of figure 2, the image is then projected at 22. With regards to the fixed relationship, at least for the instant the picture is taken they remain in a fixed relationship also see column 4 lines 13 and 14), wherein said imaging device is free from being the projector optics from which said image is projected from said projector. (As acknowledged by applicant on page 21 the imagining device (camera) is separate from the projector and accordingly its optics.)

With regards to applicant's claims 6-8:

Sukthankar teaches in columns 4 and 5 starting with lines 63 to 47 the exact means by which the image is transformed which includes both horizontal and vertical adjustment which is further demonstrated in figure 5 for example which shows that the un-adjusted image is distorted both horizontally and vertically and the final un-distorted image 20 is completely corrected which would require adjustment in two different directions (as is claimed in applicant's claim 8)

With regards to applicant's claim 9:

Sukthankar teaches in column 6 lines 13-21 an alternative embodiment where the camera is integral to the projector.

With regards to applicant's claim 10:

Sukthankar teaches in column 4 lines 8-24 (especially lines 21 and 22) that the above method can be performed fully automatically and further teaches in column 5 lines 55-60 that in an alternative embodiment automatic focusing is performed before keystone correction.

With regards to applicant's claim 11:

As shown in figure 2, the method is performed in the order claimed in applicant's claim 10.

With regards to applicant's claim 12:

The manual initiating of the keystone adjustment process is inherently initiated by pressing a button of some sort.

With regards to applicant's claims 13 and 14:

See above, the camera is held fixed as taught in column 4 lines 13 and 14. (In order for the camera to be mounted (i.e. attached to something) in a known location the relationship including offset with respect to a projection lens of said projector must be fixed.

With regards to applicant's claim 17:

As described in column 5 lines 56-60, everything is based on the previous step in the method.

With regards to applicant's claim 18:

See above.

With regards to applicant's claim 19:

As described in column 4 lines 8-24 the method can be fully automatic, partially automatic or fully manual, other then the fully automatic, the user would initiate the adjustment process.

With regards to applicant's claims 21 and 22:

See above in the case of fully automatic.

With regards to applicant's claim 23:

See with regards to applicant's claim 19 where the method is not fully automatic.

With regards to applicant's claim 24:

Sukthankar teaches in column 4 lines 13-24 that in semi-automatic calibration that the keystone adjustment is directed by a user and inherently while a user was

triggering the keystone adjustment and making the adjustment they would be continuously adjusting it which includes maintaining the previous adjustment.

With regards to applicant's claim 25:

A pattern is projected (calibration regions see column 4 lines 8-39 which describes the projection of the pattern (although it is described in the context of the manual version the automated version would simply have a computer replace the human)).

With regards to applicant's claims 30 and 31:

In the semi-automatic mode, the user indicates a direction of adjustment of keystone adjustment, which inherently can be one of a plurality of directions (see column 4 lines 8-24)

With regards to applicant's claims 32 and 42:

The image inherently dynamically changes (for example projecting a TV program which dynamically changes at 60hertz.)

With regards to applicant's claim 34:

In fully manual the user specifies the ratio of with to length (see columns 4 and 5 which discuss how the mapping is performed, the ratio of with to length would b calculated as the borders are determined.)

With regards to applicant's claim 35:

See the with regards to applicant's claim 25

With regards to applicant's claims 40 and 41:

See the with regards to applicant's claims 30 and 31 above.

With regards to applicant's claim 55:

See above.

With regards to applicant's claims 56-58:

See the with regards to claims 13 and 14.

With regards to applicant's claims 59-62:

These are aspects of manual adjusting of either focusing or keystoning, Sukthankar teaches both software correction and hardware correction (column 5 lines 48 through column 6 lines 12.)

With regards to applicant's claims 63 and 64:

The calibration parameters are inherently stored in parameters, which are inherently in look up tables.

With regards to applicant's claim 65:

See above.

With regards to applicant's claim 67:

See the with regards to applicant's claim 10.

With regards to applicant's claim 68:

Clearly the auto-positioning centers the image on the projection screen.

With regards to applicant's claims 69-71:

The location/shape of the screen is determined before the transformation and other optical changes are made.

With regards to applicant's claim 72:

See the with regards to applicant's claims 13 and 14.

With regards to applicant's claim 78:

See above.

With regards to applicant's claim 79:

As shown in figure 1 among others the screen is rectangular.

With regards to applicant's claim 80:

The image is also rectangular.

With regards to applicant's claims 81 and 82:

The lower edge of the projection screen is horizontally aligned with respect to a user. (Inherent.)

With regards to applicant's claim 83:

The image modifying is performed after the image adjusting for keystone effect.

With regards to applicant's claims 84 and 85:

See above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 15, 16, 20, 27-29, 33, 37-39, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sukthankar as applied to claims 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85 above and further in view of Hasegawa (US 6,598,978.)

Sukthankar as described above teaches a method for adjusting keystoning in a projector which comprises initiating a keystoning adjustment process, sensing using an imaging device an image projected by the projector, adjusting the focus of the projector,

determining a transformation to adjust the keystoning of an image projected from the projector; modifying the image projected from the projector in accordance with the transformation; and projecting the modified image from the projector. Sukthankar does not teach a further imaging device sensing the image.

Having a further sensing device to allow a user to interact with either the projector or with the computer performing the presentation is taught by Hasegawa. Hasegawa teaches in figure 1 a projection system including a projector (2), a camera (1), and a pointer (4, which can also be considered a remote control as is claimed in applicant's claim 20). Hasegawa teaches in column 1 lines 13-22 that such a system allows the user to draw on the display image among other things. Given that it is useful to allow a user to interact with the presentation system, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include additional imagining devices for sensing the images on the screen.

With regards to applicant's claims 27-29, 33, 37-39, and 43:

Although Hasegawa does not teach using the pointer specifically to control the Keystone, one with ordinary skill in the art would recognize that remote controls including in the form of a pointer are frequently used to adjust such things as focus, and keystone. Accordingly the pointer/remote control of Hasegawa can be used to control the projector.

7. Claim 26, 36, and 44-54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sukthankar as applied to claims 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85 above and further in view of Geng (US 6,700,669.)

Sukthankar as described above in more detail teaches a method for adjusting keystoning in a projector which includes an imaging device and projector maintained in a fixed relationship and are free from being the projector optics from which the image is projected from the projector. Sukthankar does not specifically teach projecting patterns when performing the method of adjusting, which comprise among other things different frequencies and Sukthankar does not teach specifically teach a method for locating the screen.

Geng teaches a method for locating various objects, which would include screens that are at any orientation to a projector, and determining their shape and orientation. Geng teaches in column 4 lines 59-65 that multiple frequencies are projected (patterns) on the surface to be projected upon. This image is then captured by a plurality of image capturing devices (see figure 11). With the captured image a processor performs a series of steps that are described in columns 6 and 7, which includes applicant's steps a-f of claim 44.

Geng teaches in column 4 lines 43-55 that this method is far superior to prior art method of locating a screen or other surface to be projected upon in terms of accuracy and speed. Given that in the keystone correcting projection arts it is highly useful for the projector to know exactly what orientation the screen is to the projector and in the case where the screen is planner the shape of the screen (see for example US 6,431,711 to

Pinhanez which teaches projecting on non-planner surfaces), it would have been obvious to one of ordinary skill in the art at the time the invention was made to include Geng's method of determining the location of a screen by a projector in the projector taught by Sukthankar.

With regards to applicant's claims 26 and 36:

Geng teaches multiple frequencies. (See above.)

With regards to applicant's claim 46:

Geng determines the location of the screen relative to the projector.

With regards to applicant's claims 47 and 48:

Geng teaches that the image is received by an image sensor device in column 4 lines 14 such as a CCD camera, which is made up of a plurality of one-dimensional sensors.

With regards to applicant's claim 49:

Geng teaches using a plurality of imaging devices.

With regards to applicant's claims 50-54:

See the rejection of claims 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85 above.

Response to Arguments

8. Applicant's arguments filed 12/27/2004 have been fully considered but they are not persuasive.

Applicant's arguments can be summarized by two major points: 1. Sukthankar does not teach a fixed relationship between the imaging device and projector. 2. That the user free steps of the methods in Sukthankar are done manually. Each will be addressed separately and then remaining minor points will be addressed.

With regards to the first point where applicant argues that Sukthankar does not teach a fixed relationship. This is incorrect, see column 4 lines 13 and 14 which teach "the camera 18 and projector 12 are mounted in a *known position and orientation*" Clearly this is a teaching of them being mounted in a fixed position (the system would not function if during projecting a user picked up the camera and moved it elsewhere as it must be mounted in a known position and orientation. Accordingly applicant's argument is not persuasive, since Sukthankar clearly teaches the limitation.

With regards to the second point, applicant alleges that Sukthankar does not teach that the adjusting of the focus and other steps of the methods without user input, not conceding the point, even if a user had to push a button to initiate the automatic adjustment this is still within the claimed limitation as applicant does not ever claim that the first step (initiating a keystoning adjustment process) is done without user input. Applicant's claim language allows the first step a to be performed with user input. Further applicant's arguments that Sukthankar performs the various steps manually are

entirely based on applicant only reading the manual calibration embodiments of Sukthankar, however Sukthankar teaches a fully automated calibration embodiment, which would inherently substitute a computer or microprocessor for the human of the manual steps. Accordingly applicant's arguments are not found persuasive.

With regards to applicant's claim 18, column 5 lines 55-60 teaches "For instance, the present invention could perform automatic focusing through the hardware interface, followed by fully automatic keystone correction in software and interactive placement of the final corrected image" this is a clear teaching that keystone correction is performed following focus adjusting as is claimed in applicant's claim 18.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The above rejections have only been modified to reflect applicant's amendments and to better clarify where in Sukthankar teachings are found in response to applicant's arguments.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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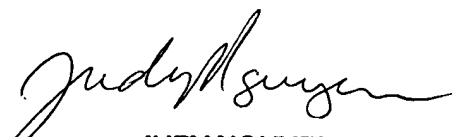

JUDY NGUYEN
SUPERVISORY PATENT EXAMINER